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## Regression model to calculate prices of auditing services of public tenders: Lithuanian example

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### Abstract

Problem substantiation. The high price compensates audit firm for scarcity, risk or rewards for your skills. If, on the other hand, your niche is providing fast turnaround and accurate personal income tax returns, then a low price approach may be the most suitable strategy. In this case, the efficiency of your service enables you to charge a lower fee, which in turn allows firm to boost the volume of activity and earn sufficient profit from each unit. May low price approach be the most suitable strategy in public procurement procedures? The regression model shows, that factors, influencing price of public tenders are gross carrying value of the assets, employees number and planned revenue. Regression model by using significance level  $F < 0,05$  were used for the confirmation of factor importance, R Square criterion – 0,815 ( $> 0,7$ ) for the confirmation of the reliance of pricing factors shows whether you are on course. The paper analyses the following questions:

- (1) Can the current audit market pricing strategy give quality guaranty?
- (2) How calculate the price of public tenders?
- (3) How should the low pricing problem be solved?

Hypotheses:  $H_0$  – May low price approach be the most suitable strategy in public procurement procedures and alternative?

Results: it can be taken affirmation by  $H_0$ , e.g. accept auditors needs maintain quality. Current audit market pricing strategy doesn't give quality guaranty. Public tenders can be calculated of using regression model. Low pricing problem can't be solved by pricing regulation, but pricing model, set by author is the way on preventing corruption in public tenders.

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## 1. Introduction

The fact that you are a good accountant does not automatically mean that you are good at running an accounting business. Running a business requires its own set of skills and disciplines that are quite separate from the skills of the profession itself. Once your firm is operating, much of your time each day will be spent delivering accounting services. You will most likely be under time pressures, at least some of the time. So a key challenge throughout your professional life will be to balance your professional work and the management needs of your business. Too many professionals see their firms as something other than a business, perhaps as an extension of their professional development or calling. Often the business can become no more than a job, and instead of creating freedom for the partners, they end up losing their lives to the business. Where they neglect the business issues of their firm, it shows quickly. The results can include: problems with work–lifestyle, low profitability and/or poor liquidity, poor efficiency, lack of risk management, the absence of necessary quality control, high employee turnover, loss of clients or loss of professional reputation.

The level of problem research. There are ongoing worldwide discussions about how to apply the issues of business ethics and risk to assure the fair competition. A big part of theoretical free market analysis is based on the so called fair competition model. If the deviations from this model cannot be considered insignificant, the circumstances for the competition should be reckoned strained. There are multiplicity of equilibrium theories, maintaining that besides optimal, rational balance between price and demand (Paret distribution) there are others, economically less rational, however temporary or even for a longer time stable market states. Firms often price their services in a similar way, and may even brand themselves in a similar way. According to Leung, Coram, Cooper & Richardson (2008) many firms also pride themselves on their professionalism, confidentiality, communication style and the personalities of the principals and their team. So how do you make audit firm different? Price competition requires a volume market to be profitable, and typically the delivery of professional services is not an area of high-volume transactions. Differentiation is likely best achieved through your service offering. Dominating the “Overall cost leadership” strategy is based on delivering professional services with a low cost-base, which in turn enables managers to sell audit service at a lower price yet still be profitable. A strong focus on cost reduction is required. This can be achieved, for example, whenever you buy the goods and services which are consumed as you deliver your accounting services; it can be achieved by eliminating loss-making services/products or clients; or it comes about from adopting a “no frills” approach to all your procedures and actions. The benefit of “low cost” is that you can undercut the prices which competitors charge, and in doing so gain market share from them. “Low prices” is the easy part to achieve; it is the “low cost” within your own firm which represents the tough and ongoing challenge. Hypotheses: Ho – May low price approach be the most suitable strategy in public procurement procedures and alternative H1.

The paper analyses the following questions:

- (1) Can the current audit market pricing strategy give quality guaranty?
- (2) How calculate the price of public tenders?
- (3) How should the low pricing problem be solved?

Research object: pricing policy of audit business.

The aim of the research: to design the regression model of pricing in audit business.

Objectives:

1. To distinguish the key competitive factors of audit business;
2. To perform the research of the reliance of some factors;
3. To design the model of pricing factors impact.

The methods applied: expert research – for the identification of pricing factors (see table 1), regression model by using significance level  $F < 0,05$  – for the confirmation of factor importance, R Square criterion  $> 0,7$  – for the confirmation of the reliance of pricing factors, for the affirmation of hypotheses – predicted y criterion.

## 2. Theoretical pricing rationale

One of the most difficult, yet important, issues you must decide as an entrepreneur is how much to charge for your product or service. While there is no one single right way to determine your pricing strategy, fortunately there

are some guidelines from scientists Leung, Coram, Cooper & Richardson (2008), that will help you with your decision. Before we get to the actual pricing models, here are some of the factors that you need to consider:

- **Positioning** - how are you positioning your product in the market? Is pricing going to be a key part of that positioning? If you're running a discount firm, you're always going to be trying to keep your prices as low as possible (or at least lower than your competitors). On the other hand, if you're positioning your product as an exclusive luxury product, a price that's too low may actually hurt your image. The pricing has to be consistent with the positioning. People really do hold strongly to the idea that you get what you pay for.

- **Demand Curve** - how will your pricing affect demand? You're going to have to do some basic market research to find this out, even if it's informal. Get 10 people to answer a simple questionnaire, asking them, "Would you buy this product/service at X price? Y price? Z price?" For a larger venture, you'll want to do something more formal, of course perhaps hire a market research firm. But even a sole practitioner can chart a basic curve that says that at X price, X' percentage will buy, at Y price, Y' will buy, and at Z price Z' will buy.

- **Cost** - calculate the fixed and variable costs associated with your product or service. How much is the "cost of goods", i.e., a cost associated with each item sold or service delivered, and how much is "fixed overhead", i.e., it doesn't change unless your company changes dramatically in size? Remember that your gross margin (price minus cost of goods) has to amply cover your fixed overhead in order for you to turn a profit. Many entrepreneurs underestimate this and it gets them into trouble.

- **Environmental factors** - are there any legal or other constraints on pricing? For example, in some cities, towing fees from auto accidents are set at a fixed price by law. Or for doctors, insurance companies and Medicare will only reimburse a certain price. Also, what possible actions might your competitors take? Will too low a price from you trigger a price war? Find out what external factors may affect your pricing.

According to Brooks & Dunn (2010) the next step is to determine pricing objectives. Now that we have the information we need and are clear about what we're trying to achieve, we're ready to take a look at specific pricing methods to help us arrive at our actual numbers.

### 3. Research process and the results and discussion

Researches Pong & Whittington (1994) set question: Whether is available in public tenders of audit services establishment of prices minimum and maximum limits? Their responses were based on a scientific fact that the free market is able to regulate prices of competitors, but the audit firm, offered the highest and the lowest price can be rejected when choosing from the remaining ones. The same answer gives Francis, Philbrick & Schipper (2005). Whether it is a good practice example? Scientists Turpin (1990), Simon & Francis (1988), Simunic (1980) examined the countries, that perform audit services procurement practices of public tenders, experience and it is possible to do the conclusion on basis their scientific discoveries that this is the way on preventing corruption. Wide discussion provided Leung, Coram, Cooper & Richardson (2008). His question was: what are managers trying to accomplish with audit pricing? Based on theoretical and practical research database are definite answer submitted: (1) short-term profit maximization; (2) short-term revenue maximization; (3) maximize quantity; (4) maximize profit margin; (5) differentiation; (6) survival - in certain situations, such as a price war, market decline or market saturation, you must temporarily set a price that will cover costs and allow you to continue operations (APESB, 2011). Hay, Knechel & Wong (2006) evaluated the price of audit in accordance with demand and supply. They found that, in general the competition stabilizes the low price, but these principles of self-regulation does not work and needs of public tenders. Ghosh & Lustgarten (2006), studied pricing of initial audit engagements by large and small audit firms, based on all strategies whether they are fit, as summarized before in article, researcher scientists Leung, Coram, Cooper & Richardson (2008), that will help you with pricing decision. According to this opinion, there isn't one strategy, firm managers before we get to the actual pricing models, in public tenders need to consider at first environmental factors. This analysis led to a set of desire to analyze the pricing as simple as possible. The data was used for one of the audit firm. Primarily were established expert research – for the identification of pricing factors (see table 1).

Table 1. Expert research – for the identification of pricing factors

Audit price including VAT, LTL	Gross carrying value of the assets, mln. LTL	Employees number	Planned revenue mln. LTL
Y	x1	x2	x3
3864	19	157	14
5856	120	49	23
5869	11	308	13
3364	3	214	3
7496	16	328	23
11646	1242	256	89
3570	4	21	3
5381	166	131	4
4536	137	70	2
6383	159	301	40
5808	75	114	30
5929	14	75	4
5200	14	639	30
3449	9	33	2
15670	788	947	100
5984	19	163	7
5324	602	282	33
5984	909	361	40
9680	995	303	43
5874	11	568	23

Regression model have been using significance level  $F < 0,05$  – for the confirmation of factor importance, R Square criterion  $> 0,7$  – for the confirmation of the reliance of pricing factors, for the affirmation of hypotheses – predicted y criterion. After examination of the feasibility of the method regression, I have decided to use it to create a pricing model. I use MS Excel possibilities.

## SUMMARY OUTPUT

Regression Statistics		
Multiple R	0,902882077	
R Square	<b>0,81519604</b>	<b>&gt;0,7</b>
Adjusted R Square	0,780545303	
Standard Error	1387,175412	
Observations	20	

## ANOVA

	df	SS	MS	F	Significance F
Regression	3	135810562,6	45270187,53	23,52608	<b>0,00000415</b>
Residual	16	30788089,97	1924255,623		<b>&lt;0,05</b>
Total	19	166598652,6			

	Coefficients	Standard Error	t Stat	P-value
Intercept	3649,232434	489,7468696	7,451262397	1,38E-06
X Variable 1	0,120651413	1,443035844	0,083609436	0,934404
X Variable 2	1,148187676	2,054376099	0,558898478	0,583969
X Variable 3	89,89692899	26,78152551	3,356676936	0,00401

After examining the data in the regression method capabilities, i have made the pricing model presented below.

$$Y = 3649,23 + 0,120654X_1 + 1,148X_2 + 89,90X_3 \quad (1)$$

Table 2. Influence of identification of pricing strategy, LTL

Observation	Predicted price	Factual price	Influence	Standard Residuals
1	5072	3864	1208	-0,95
2	5743	5856	-113	0,09
3	5173	5869	-696	0,55
4	4129	3364	765	-0,60
5	6068	7496	-1428	1,12
6	12085	11646	439	-0,34
7	3935	3570	365	-0,29
8	4188	5381	-1193	0,94
9	3962	4536	-574	0,45
10	7637	6383	1254	-0,99
11	6468	5808	660	-0,52
12	4061	5929	-1868	1,47
13	7064	5200	1864	-1,46
14	3859	3449	410	-0,32
15	13821	15670	-1849	1,45
16	4432	5984	-1552	1,22
17	7039	5324	1715	-1,35
18	7760	5984	1776	-1,40
19	8001	9680	-1679	1,32
20	6370	5874	496	-0,39
	126867	126867	0	0

As shown in the 2 table, „predicted price“ is higher in 11 observation. Audit fees budget remains constant 126867 LTL.

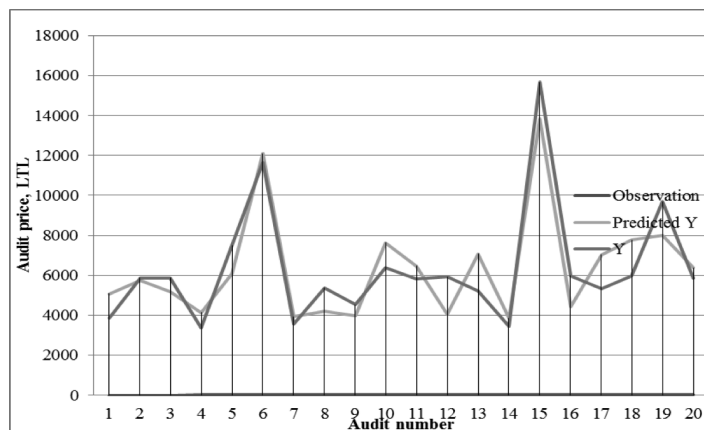


Figure 1. Example of a figure

Results: the model of the pricing policy regression of audit enterprises was designed.

#### 4. Conclusions

Hypotheses: Ho – May low price approach be the most suitable strategy in public procurement procedures can be taken affirmation, accept auditors needs maintain quality.

Current audit market pricing strategy doesn't give quality guaranty.

Public tenders can be calculated of using regression model.

Lowe pricing problem can't be solved by pricing regulation, but pricing model, set by author is the way on preventing corruption in public tenders.

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